

**ECOLOGICALLY ORIENTATED
METHODS AND MONITORING IN
RIVER ENGINEERING
ECOLOGICALLY ORIENTED AND
TECHNICAL MEASURES IN RIVER
ENGINEERING**

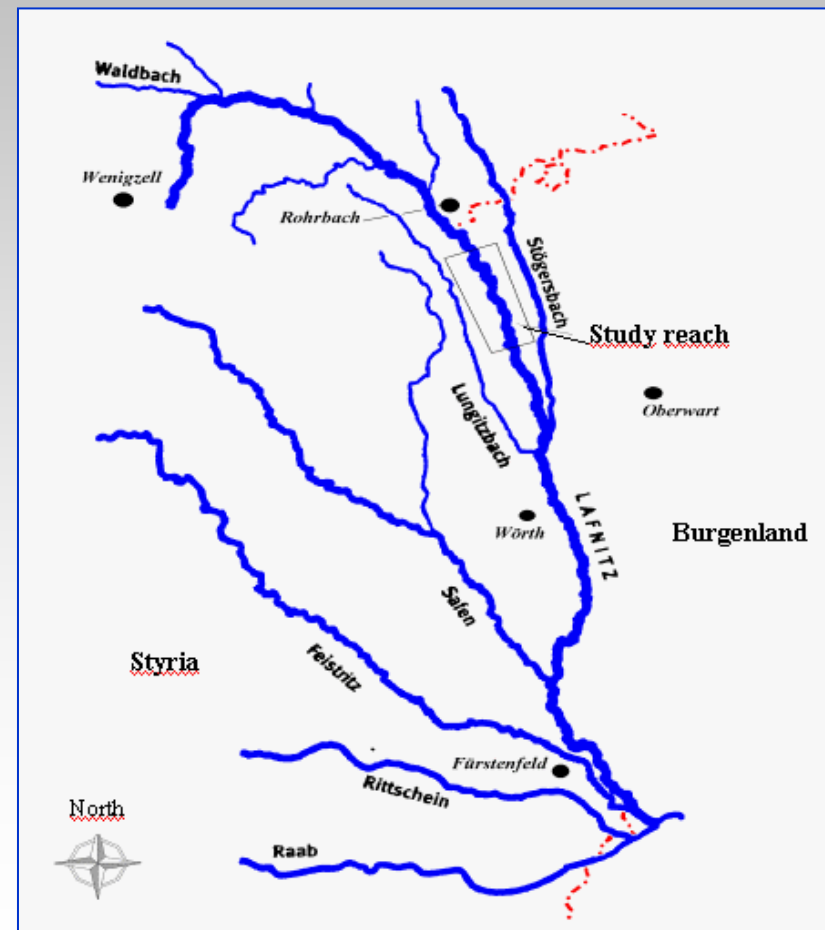
H. M. HABERSACK



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Study reach

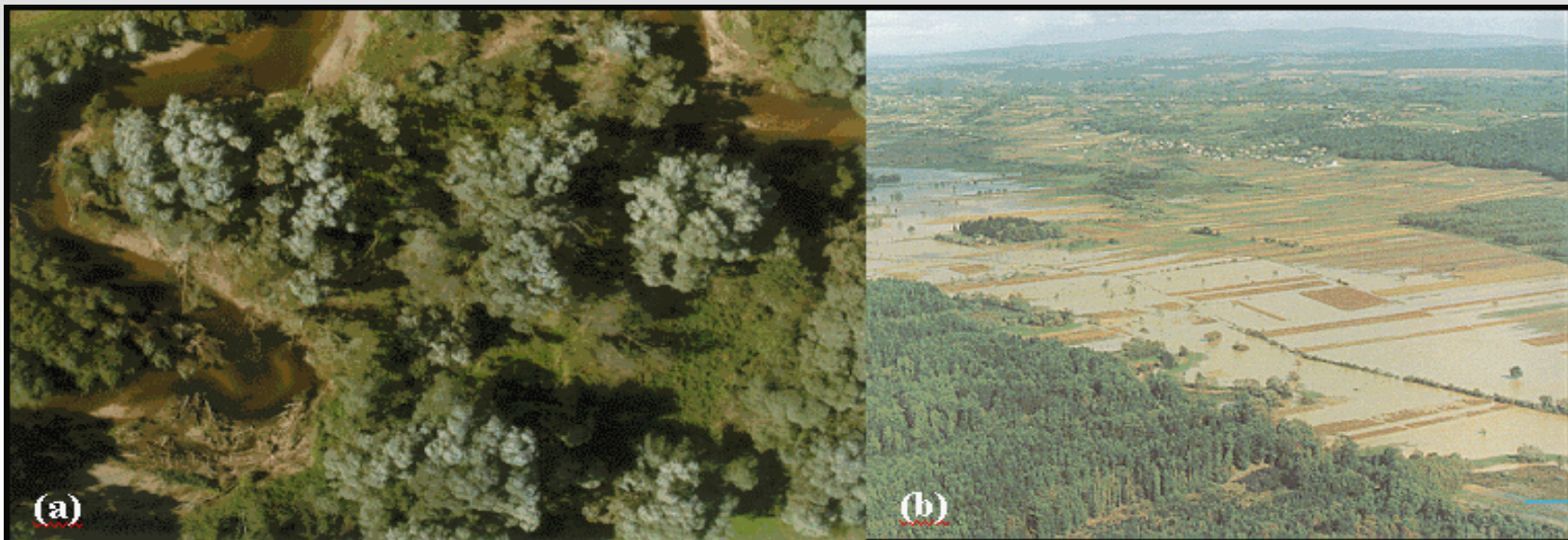
- Austria - Europe
- border between Styria and Burgenland
- River Lafnitz
- negligible anthropogenic influences
- representative meander
- detailed investigation of 2D - modeling



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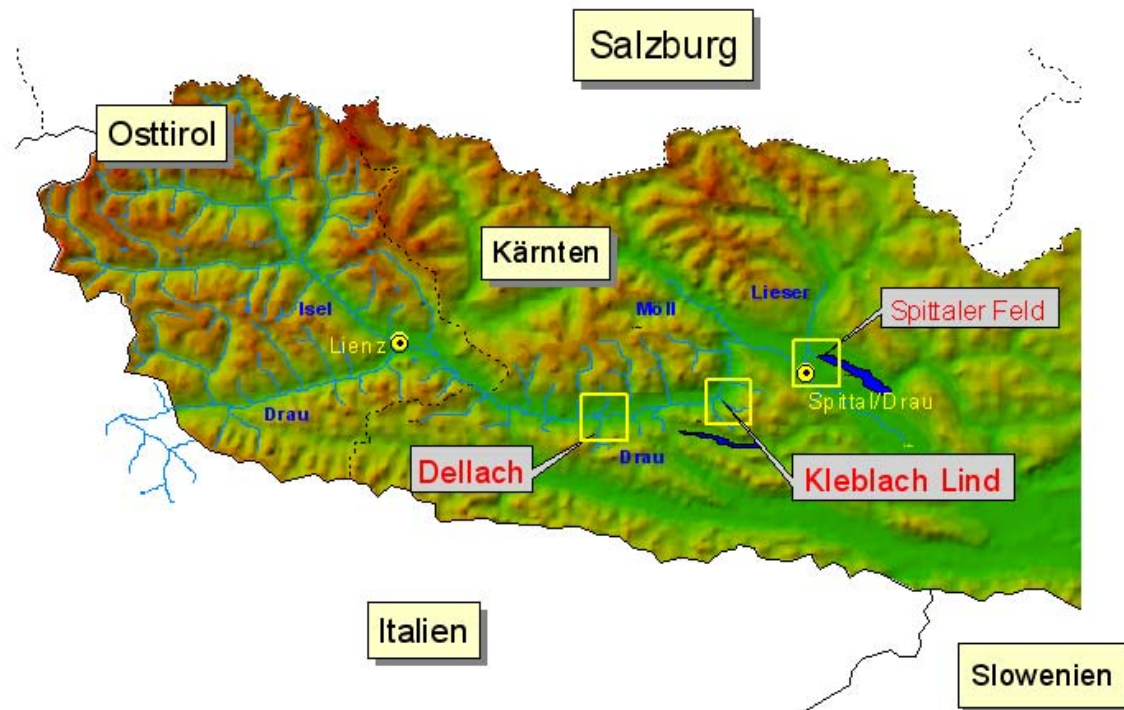
Inbank and overbank flow

- inbank flow (constant side erosion)
- overbank flow (higher velocities and shear stresses)
- characteristic geometry (discharge, slope, grain size distribution, vegetation and content of cohesive material in the river banks)



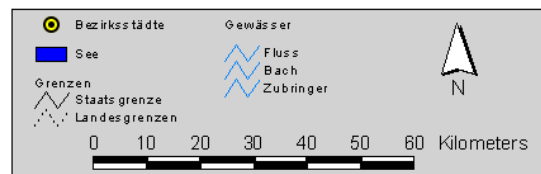
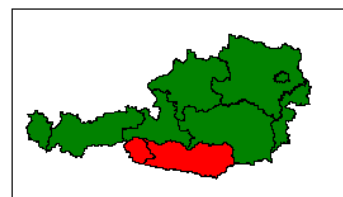
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Upper Drau



Gauging station Drauhofen





- Catchm.: 3674,4 km²
- stream order 7
- mean slope of 1,5 ‰
- mean discharge 102,3 m³/s
- HQ₁₀₀ ca. 1600 m³/s
- Bed width ca. 55-80 m
- grain size d_m ca. 36 mm



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Gewässerbetreuungskonzept obere Drau

Legende:

-  Bei HQ5 ueberflutete Flaechen
-  Bei HQ10 ueberflutete Flaechen
-  Bei HQ30 ueberflutete Flaechen
-  Bei HQ100 ueberflutete Flaechen

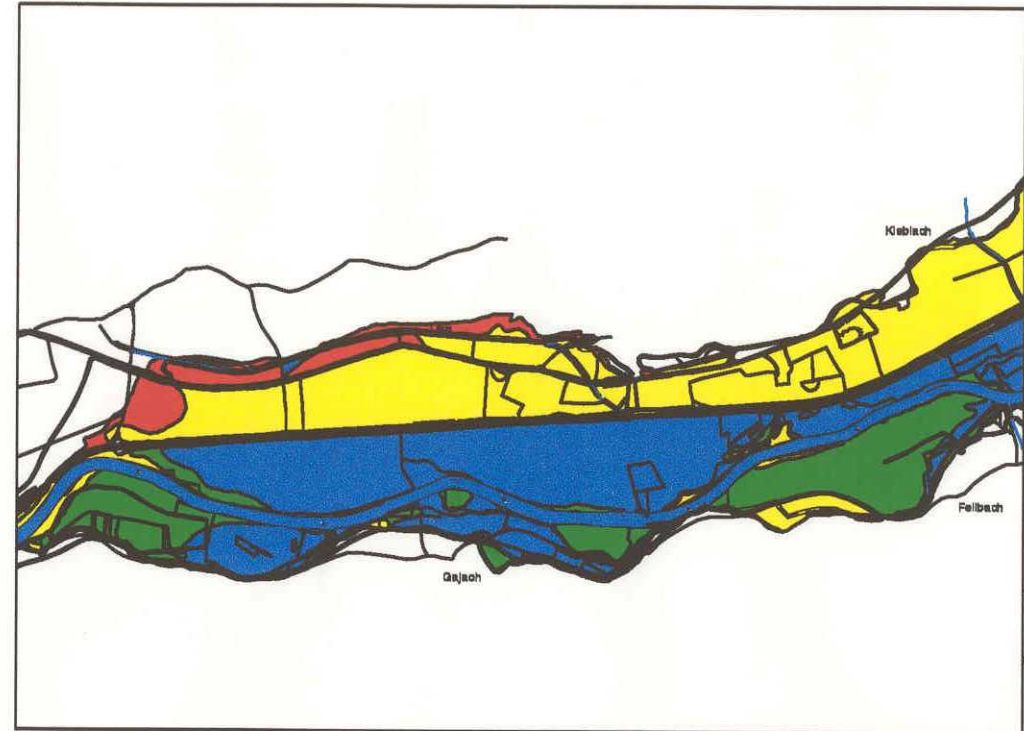
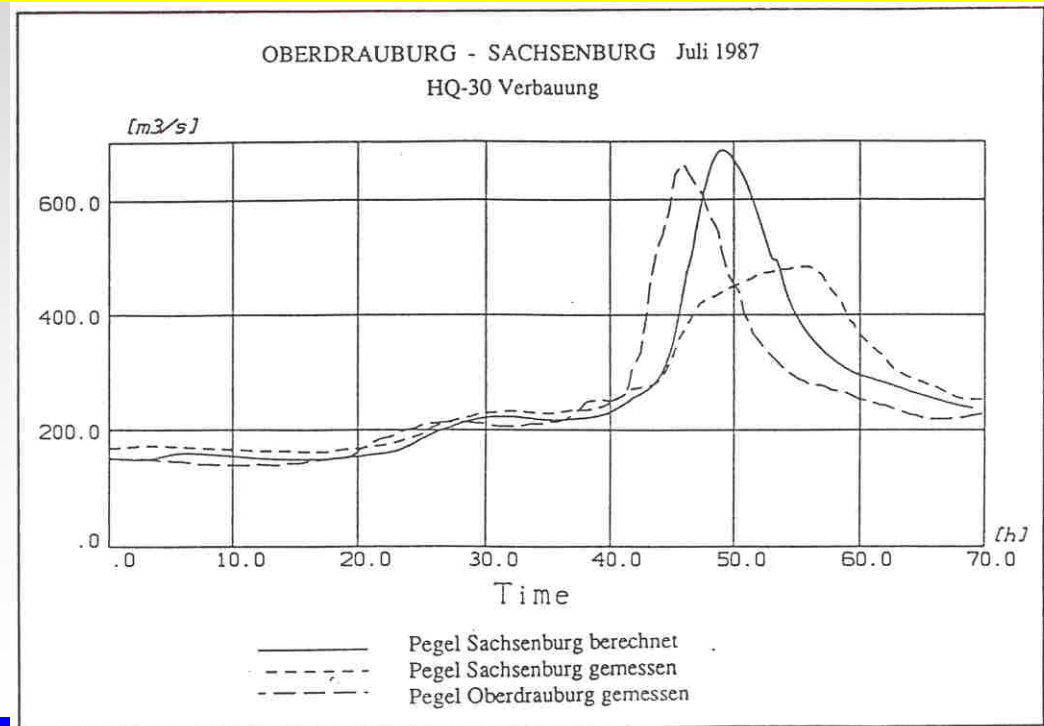


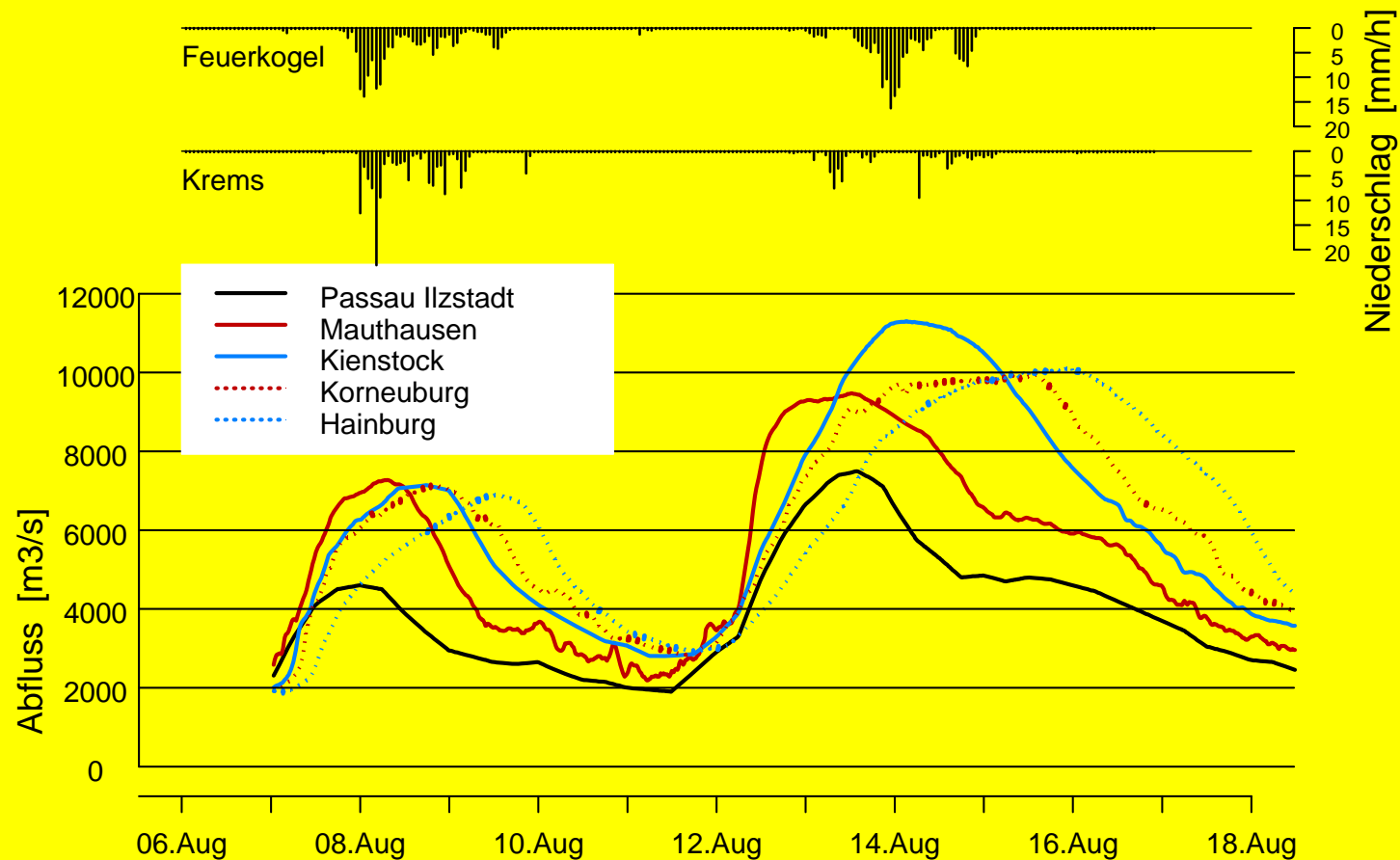
Abb. 9.4: Darstellung der Überflutungsflächen an der Drau

Example Upper Drau

For the 15-year event of Juli 1987 a channalisation (levee) would give an increase of the flood peak from $483 \text{ m}^3/\text{s}$ to $685 \text{ m}^3/\text{s}$. In Sachsenburg instead of a 3-4 years flood a 10-11 years flood would occur, (Nachtnebel et al., 1993). Flow time would be significantly reduced by missing retention effect of 10 to 3,5 hours



Volume



Pegel	HQ-Scheitel in m ³ /s	Bedarf an Retentionsvolumen bei Scheitelreduktion um						
		100	200	300	500	800	1200	1500
Passau (Donau) ²⁾	7497	1.3	4.4	8.8	20.2	42	79	113
Kienstock (Donau) ²⁾	11297	2.8	8.2	15.0	31.6	63	116	161
Hainburg (Donau) ²⁾	10095	2.9	10.0	19.7	44.7	94	175	247
Steyr (Enns) ²⁾	3077	0.5	1.5	2.9	7.3	17	39	68
Salzburg (Salzach) ²⁾	2274	0.7	2.9	5.9	13.2	28	53	-
Wels-Lichten(Traun) ²⁾	1528	1.0	3.6	8.0	26.7	39	-	-
Zwettl (Kamp) ¹⁾	459	2.6	9.3	20.2	-	-	-	-
Stiefern (Kamp) ¹⁾	788	1.2	3.7	8.5	24.3	-	-	-

Holzmann, 2003

Retention Volume

Bedarf an Rückhalteraum

